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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

11/18/2009

ANDREW M. CALDERON
GREENBLUM AND BERNSTEIN, P.L.C.
1950 ROJ-AND CLARKE PLACE
RESTON, VA 20191

EXAMINER

MIRZA, ADNAN M

ART UNIT

PAPER NUMBER

2445

DATE MAILED: 11/18/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,538	01/16/2004	Gordan G. Greenlee	END920030141US1	5583

TITLE OF INVENTION: VIRTUAL CLUSTERING AND LOAD BALANCING SERVERS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	02/18/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 11/18/2009

ANDREW M. CALDERON
 GREENBLUM AND BERNSTEIN, P.L.C.
 1950 ROLAND CLARKE PLACE
 RESTON, VA 20191

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10758,538	01/16/2004	Gordan G. Greenlee	END920030141US1	5583

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	02/18/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
MIRZA, ADNAN M	2445	709-226000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
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EXAMINER

MIRZA, ADNAN M

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PAPER NUMBER

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1094 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1094 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/758,538

Examiner

ADNAN MIRZA

Applicant(s)

GREENLEE ET AL.

Art Unit

2445

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/03/2009.
2. ☒ The allowed claim(s) is/are 1,4-18,21-24 and 27-45.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/NIVEK SRIVASTAVA/
Supervisory Patent Examiner, Art Unit 2445

1 EXAMINER'S AMENDMENT

2
3 An Examiner's Amendment to the record appears below. Should the
4 changes and/or additions be unacceptable to applicants, an amendment
5 may be filed as provided by 37 CFR 1.312. To ensure consideration of
6 such an amendment, it must be submitted no later than the payment of the
7 issue fee.

8
9 Authorization for this Examiner's Amendment was given in a telephone
10 interview with Andrew Wright on 11/03/2009.

11
12 Please amend claims 1, 18, 24 and cancel claims 2,3,19,20,25,26.

13
14 Listing of Claims

15
16
17 1. (Currently Amended) A method of processing queries in a network,
18 comprising the steps of:
19 defining a plurality of virtual clusters from a plurality of servers;
20 routing a request to a virtual cluster of the plurality of virtual clusters
21 based on predetermined criteria in order to allocate system resources;
22 removing at least one of the plurality of servers from the virtual cluster
23 when at least one of the plurality of servers is burdened;
24 creating a new virtual cluster comprising only the removed at least one of
25 the plurality of servers; _____

Deleted: and

26 returning the removed at least one of the plurality of servers back to the
27 virtual cluster when the at least one of the plurality of servers is unburdened;
28 monitoring performance of the plurality of servers; and
29 sending a report in response to workload at one of the plurality of servers
30 exceeding a pre-determined threshold so that routing of further requests to the one
31 of the plurality of servers is altered; and
32 removing the one of the plurality of servers from an associated virtual
33 cluster and adding the one of the plurality of servers back into the associated
34 virtual cluster in response to workload falling below the predetermined threshold.

35
36 2. (Canceled)

37
38 3. (Canceled)

39
40 4. (Currently Amended) The method of claim 1, wherein the sending a
41 report sends a report to a network dispatcher and the network dispatcher performs
42 the routing.

Deleted: 2

43
44 5. (Original) The method of claim 1, further comprising the steps of:
45 determining that one of the plurality of servers is overburdened based on
46 statistics; and
47 reducing workload to the one of the plurality of servers if the statistics are
48 above a threshold.

49
50 6. (Original) The method of claim 5, wherein the reducing step includes at
51 least one of removing the one of a plurality of servers from one of the plurality of
52 virtual clusters and limiting further requests from being routed to the one of a
53 plurality of servers.

54

55 7. (Original) The method of claim 6, wherein the reducing step includes
56 reassigning the one of a plurality of servers to another one of the plurality of
57 virtual clusters.
58

59 8. (Original) The method of claim 1, wherein at least one of the plurality
60 of servers is assigned to more than one of the plurality of virtual clusters.
61

62 9. (Original) The method of claim 1, wherein the predetermined criteria
63 includes at least one of requester identity, requested application, time of day, day
64 of week, and performance statistics.
65

66 10. (Original) The method of claim 9, wherein the requester identity is an
67 internet address.
68

69 11. (Original) The method of claim 9, wherein the performance statistics
70 include at least one of central processing unit (CPU) performance statistics,
71 memory statistics, connection counts, throughput statistics, and response time
72 statistics.
73

74 12. (Original) The method of claim 1, wherein the routing step includes
75 selecting one of the plurality of virtual clusters for routing based on at least one of
76 a requester's identity and a requested application.
77

78 13. (Original) The method of claim 12, further including selecting one
79 server from the one of the plurality of virtual clusters for routing based on
80 statistics.
81

82 14. (Original) The method of claim 13, wherein the selecting is based on
83 performance statistics.
84

85 15. (Original) The method of claim 1, wherein at least one of the plurality
86 of servers is at least one of a lightweight directory access protocol (LDAP) server
87 and a web application server.

88
89 16. (Original) The method of claim 1, wherein the routing uses rules based
90 routing.

91
92 17. (Original) The method of claim 1, further comprising the steps of
93 reassigning one of the plurality of servers from one of the plurality of virtual
94 clusters to another one of the plurality of virtual clusters, wherein the one of the
95 plurality of virtual clusters has a workload below a threshold and the another one
96 of the plurality of virtual clusters has a workload above the predetermined
97 threshold.

98
99 18. (Currently Amended) A method for load balancing servers, comprising
100 the steps of:

101 allocating a plurality of servers among a plurality of virtual clusters;
102 monitoring the plurality of virtual clusters for workload capacity;
103 removing at least one of the plurality of servers from the plurality of
104 virtual clusters when at least one of the plurality of servers is burdened;
105 creating a new virtual cluster comprising only the removed at least one of
106 the plurality of servers;
107 returning the removed at least one of the plurality of servers back to the
108 plurality of virtual clusters when the at least one of the plurality of servers is
109 unburdened; and

110 reassigning at least one server from one of the plurality of virtual clusters
111 to another of the plurality of virtual clusters based on workload capacity of the at
112 least one server in order to reallocate system resources,

113 wherein the monitoring step includes determining when a workload
114 capacity of the one of the plurality of virtual clusters has crossed a threshold

based on statistics associated with the one of a plurality of virtual cluster's performance; and
further comprising the step of identifying another of the plurality of virtual cluster having available workload capacity based on statistics associated with the virtual cluster's performance and transferring at least one of the plurality of servers to the another of the virtual cluster.

19. (Canceled)

20. (Canceled)

21. (Original) The method of claim 18, wherein the reassigning at least one server includes one of:

removing the server entirely from the one of a plurality of virtual cluster, and

assigning the at least one server to both the one of a plurality of virtual clusters and the another of the plurality of virtual clusters.

22. (Original) The method of claim 18, further comprising routing a request to one of the plurality of virtual clusters based on one of the requestor's identity, the requested application, and rules.

23. (Original) The method of claim 22, further comprising selecting one server assigned to the one of the plurality of virtual clusters based on statistics for routing the request.

24. (Currently Amended) A computer program product comprising a computer usable storage medium having readable program code embodied in the storage medium, the computer program product includes at least one component to:

145 define a plurality of virtual clusters from a plurality of servers;
146 route a request to a virtual cluster of the plurality of virtual clusters based
147 on predetermined criteria to allocate system resources;
148 remove at least one of the plurality of servers from the virtual cluster when
149 at least one of the plurality of servers is burdened;
150 create a new virtual cluster comprising only the removed at least one of
151 the plurality of servers;
152 return the removed at least one of the plurality of servers back to the
153 virtual cluster when the at least one of the plurality of servers is unburdened;
154 monitor performance of the plurality of servers;
155 send a report in response to workload at one of the plurality of servers
156 exceeding a pre-determined threshold so that routing of further requests to the one
157 of the plurality of servers is altered; and
158 remove the one of the plurality of servers from an associated virtual
159 cluster and add the one of the plurality of servers back into the associated virtual
160 cluster in response to workload falling below the predetermined threshold.

Deleted: and

162 25. (Canceled)

164 26. (Canceled)

166 27. (Original) The system of claim 24, wherein the at least one component
167 sends a report to a network dispatcher and the network dispatcher performs the
168 routing.

170 28. (Original) The system of claim 24, wherein the at least one
171 component:
172 determines that one of the plurality of servers is overburdened based on
173 statistics; and

174 reduces workload to the one of a plurality of servers if the statistics are
175 above a threshold.

176

177 29. (Original) The system of claim 28, wherein the at least one component
178 removes the one of a plurality of servers from one of the plurality of virtual
179 clusters and limits further requests from being routed to the one of a plurality of
180 servers.

181

182 30. (Original) The system of claim 29, wherein the at least one component
183 reassigns the one of a plurality of servers to another one of the plurality of virtual
184 clusters to reallocate the system resources.

185

186 31. (Original) The system of claim 24, wherein the at least one component
187 assigns at least one of the plurality of servers to more than one of the plurality of
188 virtual clusters.

189

190 32. (Original) The system of claim 24, wherein the predetermined criteria
191 includes at least one of requester identity, requested application, time of day, day
192 of week, performance statistics.

193

194 33. (Original) The system of claim 32, wherein the requester identity is a
195 network address.

196

197 34. (Original) The system of claim 32, wherein the performance statistics
198 include at least one of central processing unit (CPU) performance statistics,
199 memory statistics, connection counts, throughput statistics, and response time
200 statistics.

201

202 35. (Original) The system of claim 24, wherein the at least one component
203 selects one of the plurality of virtual clusters for routing based on at least one of a
204 requester's identity, composite statistics, and a requested application.

205

206 36. (Original) The system of claim 24, wherein the at least one component
207 selects a non over-burdened server from the one of the plurality of virtual clusters
208 to process information.

209

210 37. (Original) The system of claim 36, wherein the at least one component
211 selects based on performance statistics.

212

213 38. (Original) The system of claim 24, wherein at least one of the plurality
214 of servers is one of a lightweight directory access protocol (LDAP) server and a
215 web application server.

216

217 39. (Original) The system of claim 24, wherein the at least one component
218 uses rules based routing.

219

220 40. (Original) The system of claim 24, wherein the at least one component
221 reassigns one of the plurality of servers from one of the plurality of virtual
222 clusters to another one of the plurality of virtual clusters, wherein the another of
223 the plurality of virtual clusters has a workload below a threshold and the one of
224 the plurality of virtual clusters has a workload above the predetermined threshold.

225

226 41. (Previously Presented) The method of claim 1, further comprising
227 projecting a rate of routing to each of the plurality of servers.

228

229 42. (Previously Presented) The method of claim 41, further comprising
230 adjusting the rate of routing based on a relative degree of overload on at least one
231 of the plurality of servers.

~~send a report in response to workload at one of the plurality of servers
exceeding a pre-determined threshold so that routing of further requests to the one
of the plurality of servers is altered; and
remove the one of the plurality of servers from an associated virtual
cluster and add the one of the plurality of servers back into the associated virtual
cluster in response to workload falling below the predetermined threshold.”.~~

These limitations are incorporated into all of the independent claims
(claims 1, 18, 24).

Second Bruckert disclosed a scalable clustered system includes a
global fabric, and two or more cluster nodes interconnected via the global
fabric and two or more cluster nodes interconnected via the global fabric.
Each cluster node includes a node naming agent (NNA), a local fabric and
one or more end nodes interconnected via the local fabric. However
Bruckert failed to disclose “~~monitor performance of the plurality of servers;
send a report in response to workload at one of the plurality of servers
exceeding a pre-determined threshold so that routing of further requests to the one
of the plurality of servers is altered; and
remove the one of the plurality of servers from an associated virtual cluster and
add the one of the plurality of servers back into the associated virtual cluster in
response to workload falling below the predetermined threshold”.~~ These
limitations are incorporated into all of the independent claims (claims 1,
18, 24).

In summary, the Examiner submits that Watt and Bruckert taught all the limitations of independent claims in combination with other elements. Specifically prior

art does not teach "monitor performance of the plurality of servers;

send a report in response to workload at one of the plurality of servers exceeding a predetermined threshold so that routing of further requests to the one of the plurality of servers is altered; and

remove the one of the plurality of servers from an associated virtual cluster and add the one of the plurality of servers back into the associated virtual cluster in response to workload falling below the predetermined threshold; therefore, claims 1, 4-18, 21-24 and 27-45 have been

deemed allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adnan Mirza whose telephone number is (571) 272-3885. The examiner can normally be reached on Monday through Friday from 9:30 A.M. to 6:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivek Srivastava can be reached on (571)-272-7304. The fax phone numbers for the organization where this application or proceeding is assigned are listed herein below.

Art Unit: 2445

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)746-7239. Customer service number is (866) 217-9197.

/NIVEK SRIVASTAVA/

Supervisory Patent Examiner, Art Unit 2445